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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,614	08/05/2003	Motohide Takeichi	106973.01	5380

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EXAMINER	
CHANG, VICTOR S	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
01/20/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/633,614	TAKEICHI ET AL.	
	Examiner	Art Unit	
	VICTOR S. CHANG	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2009 and 17 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' amendments and remarks filed 9/17/2009 and 11/17/2009 have been entered. Claims 1 and 6 are active.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Rejections not maintained are withdrawn.

Rejections Based on Prior Art

4. Claims 1 and 6 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shiobara et al. [US 6001901].

Shiobara relates to an epoxy resin composition used as an encapsulant for filling matrix frames of advanced think packages of semiconductor devices (elements) [col. 1, ll. 3-9]. The encapsulant fills the matrix frames without incurring conductor (electrodes) bends [col. 2, ll. 1-2]. The resin is loaded with large amounts of submicron fillers having a mean particle size of less than 1 μm, desirably less than 0.5 μm, for achieving both improved loading and minimized moisture pick-up. However, the fine filler has a very large specific surface area, as compared

with conventional fillers, and results in an extremely increased viscosity which makes it difficult to mold the compositions [col. 1, ll. 7-18]. Shiobara teaches that for the purpose of providing an epoxy resin composition having an increased filler loading and a reduced viscosity, a filler loading of about 80 to 85% by weight and a viscosity of about 100 to 300 poise at 175°C are achievable by blending a filler containing about 5 to 15% by weight of a spherical filler fraction having a submicron particle size of about 0.5 μm [col. 1, ll. 21-25]. More particularly, Shiobara teaches an epoxy resin composition comprising an epoxy resin and a curing agent (thermosetting resin), and a conventional inorganic filler, which has a mean particle size of 4-30 μm, and a specific surface area of 1.5 - 6 m^2/g. A particle size distribution that fine particles having a particle size of at most 3 μm, account for 10 to 40% by weight of the filler. The maximum particle size is less than 100 μm [col. 4, ll. 62 through col. 5, ll. 2]. Further, a fraction of the filler is ultrafine silica is blended to achieve closest packing of the filler and imparting thixotropy flow control to the composition. The fraction of the ultrafine silica filler has a mean particle size of 0.05 to 0.3 μm, and a specific surface area of 10 - 40 m^2/g [col. 5, lines 21-38].

For claims 1 and 6, since Shiobara's teaches a blend comprising a conventional inorganic filler having a specific surface area of 1.5 - 6 m^2/g, Shiobara reads on the newly amended specific surface area of 3 m^2/g. Shiobara is silent about the size relations between the particles and the electrodes on the surface of the semiconductor devices, as expressed in Equations (1)-(3). However, workable filler blends of various particle sizes satisfying the size relations are deemed to be either anticipated, or obvious routine optimizations to one of ordinary skill in the art, motivated by the desire to obtain encapsulants for advanced thin packages of semiconductor devices. Similarly, since Shiobara teaches a workable range of silica particles by weight, which

infers that the amount of the silica particles is result effective, and also teaches that the fillers minimizes moisture pick-up, a workable vol% of silica particles and amount of moisture absorption are deemed to be either anticipated, or obviously provided by practicing the invention of prior art for the same end use as the claimed invention. Regarding the term "anisotropically conductive", it is deemed to be an inherent property of the same structure and composition of the heat conductive encapsulant. Finally, Shiobara is silent about the amount of indentation during thermocompression bonding process. However, since Shiobara teaches generally the same structure and composition, and for the same end use as the claimed invention, and expressly teaches that the encapculant has an improved viscosity, and fills the matrix frames without incurring conductor (electrodes) bends, workable amount of indentation of the conductors into the filled composition is deemed to be also either anticipated, or obviously provided by practicing the invention of prior art, and dictated by the same required properties for the same end use as the claimed invention. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Response to Argument

5. Applicants argue at Remarks filed 9/17/2009, page 4:

> "Shiobara does not describe silica particles having a particle size satisfying Equations (1)-(3) in claim 1 and a specific surface area of 3 m^2/g. Instead, Shiobara describes an epoxy resin composition comprised of silica particles having (1) a mean particle size of 0.5 to 3 μm and (2) a specific surface area of 5 to 40 m^2/g, or 5 to 30 m^2/g. See Shiobara, the Abstract and col. 5, lines 25-41."

However, Shiobara teaches that for the purpose of providing an epoxy resin composition having an increased filler loading and a reduced viscosity, a blend of silica particles having different specific surface area are used. More particularly, Shiobara teaches a blend comprising a conventional inorganic filler having a specific surface area of 1.5-6 m^2/g, which reads on the newly amended specific surface area of 3 m^2/g.

Applicants argue at page 6:

> "Shiobara does not describe any indentation strength values, or indicate any result that may be achieved by adjusting these values, and thus also fails indicate that this property (indentation strength) would affect any particular characteristic of an anisotropically conductive adhesive film. Therefore, optimization of this value would not have been obvious from Shiobara."

However, since Shiobara teaches generally the same structure and composition, and for the same end use as the claimed invention, and expressly teaches that the encapculant has an improved viscosity, and fills the matrix frames without incurring conductor (electrodes) bends, workable amount of indentation of the conductors into the filled composition is deemed to be either anticipated, or obviously provided by practicing the invention of prior art, and dictated by the same required properties for the same end use as the claimed invention. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VICTOR S. CHANG whose telephone number is (571)272-1474. The examiner can normally be reached on 6:00 am - 4:00 pm, Tuesday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Victor S Chang/
Primary Examiner, Art Unit 1794